

## What Is Claimed Is:

1. In a plasma processing apparatus having a vacuum processing chamber, a sample table for mounting a sample which is processed in said vacuum processing chamber, and a plasma generation means, the plasma processing apparatus, wherein

when a plasma processing is carried out by generating a plasma according to an introduction of a gas which contains at least carbon and fluorine, and by generating a gas species which contains carbon and fluorine according to a plasma dissociation,

said plasma generation means is a plasma generation means in which a degree of said plasma dissociation is a middle degree and said gas species containing the carbon and the fluorine is generated fully in the plasma, and a temperature of a region which forms a side wall of said vacuum processing chamber is controlled to have a range of 10 °C to 120 °C.

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2. A plasma processing apparatus according to claim 1, wherein

said plasma generation means is a plasma source in which an electron temperature is a range of from 0.25 eV to 1 eV.

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is provided  
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in said plasma generation means, a drive of a plasma  
10 exciting power supply is carried out intermittedly.

as a means for adjusting a temperature of said  
15 vacuum wall, a temperature adjusted coolant medium is  
used.

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when a plasma processing is carried out by  
generating a plasma according to an introduction of a gas  
25 which contains at least carbon and fluorine and by  
generating a gas species which contains a carbon and  
fluorine according to a plasma dissociation,

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said plasma generation means is a plasma generation means in which a degree of said plasma dissociation is a middle degree and said gas species containing the carbon and the fluorine is generated fully in the plasma, and a temperature of a region which forms a side wall of said vacuum processing chamber is controlled to have a range of 10 °C to 120 °C.

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7. A plasma processing method according to claim 6, wherein

produces  
said plasma generation ~~means is~~ a plasma source in which an electron temperature is a range of from 0.25 eV to 1 eV.

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8. A plasma processing method according to claim 6, wherein

effected using  
said plasma generation ~~means~~ is an electron cyclotron resonance system in which a microwave having a frequency of from 300 MHz to 1 GHz is employed

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9. A plasma processing method according to claim 6, wherein

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in said plasma generation ~~means~~, a drive of a plasma exciting power supply is carried out intermittently.

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10. A plasma processing apparatus according to any one of from claim 6 to claim 9, wherein

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as a means for adjusting a temperature of said vacuum wall, a temperature adjusted coolant medium is used.

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